APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/626,658	07/25/2003	Yukihiko Furumoto	826.1884	1396

21171 7590 05/30/2006	EXAMINER
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ART UNIT	PAPER NUMBER
2628	

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Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

	Application No.	Applicant(s)
Office Action Summary	10/626,658	FURUMOTO ET AL.
	Examiner	Art Unit
	Daniel F. Hajnik	2628

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _07 March 2006_.

2a)☒ This action is **FINAL**.   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _1,4-6 and 9-12_ is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) _1,4-6 and 9-12_ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on _07 March 2006_ is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☒ All   b)☐ Some * c)☐ None of:

      1.☒ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
    Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____.

DETAILED ACTION

Response to Amendment

1.   Claims 1, 4-6, 9, and 10 have been amended.

2.   Claims 2, 3, 7, and 8 have been cancelled.

3.   Claims 11 and 12 have been added.

Claim Rejections - 35 USC § 103

4.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5.   Claims 1, 4-6, and 9-12 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Gadh et al. (US Patent 6629065, herein referred to as "Gadh") in

view of Conklin (US Patent 6753865, herein referred to as "Conklin").

As per claims 1 and 6, Gadh teaches the claimed:

> a three-dimensional model storing unit storing an object configuring an image of an animation as three-dimensional model information, wherein the three-dimensional model information has a tree structure configured by a plurality of hierarchies which represent constraint conditions of the three-dimensional model, and each of the hierarchies are composed of plural nodes which represent position/direction and shapes information of the three dimensional model;

By teaching of:

"D for the above examples is a tree structure" (col 22, line 46) and by teaching of:

D stores information such as (1) information about the features/elements
the user chose for building the design (their **shapes**, whether they are
solid/positive or void/negative elements, the location of element
attachments, orthogonal bounding boxes, etc.); (2) the **parent-child
hierarchy of the elements within the design** (a child element being one
which is in immediate attachment with one or more prior parent elements);
(3) **any user-specified or system-specified design constraints** on the
elements or their relationships (e.g., two elements are to be spaced apart
by some specified distance, etc.)
(col 10, lines 32-42, bolded text added for clarity).

Gadh teaches the claimed:

an operation instruction editing unit creating/editing an operation
instructions sequence for creating/editing an animation wherein the
operation instructions sequence comprises object operation instructions
and eye point operation instructions;

By teaching of:

Apparata and methods for rapid design of objects/shapes in Computer-
Aided Design (CAD) tools and in Virtual Reality (VR) environments are
described. The underlying **geometric representation of the objects
within the design tool is optimized** so that design activities such as
modeling, editing, rendering, etc
(abstract, bolded text added for clarity)

where such modeling, editing, and rendering would require object and eye point

instructions to achieve the stated functionality of the system (also see eye point

navigation in col 18, lines 14-19).

Gadh teaches the claimed limitations of:

an interference detecting unit detecting an occurrence of interference
between objects based on position/direction and shape information of the
three-dimensional model information, which is caused by executing the
object operation instruction;

an interference avoiding unit generating an object operation instruction to avoid the interference, if the occurrence of the interference is detected by said interference detecting unit;

By teaching of:

While the constrained location and alignment commands provide a quick way to position shape elements, the **bounding box-based intersection checks** provide **the ability to detect potential collisions between elements**
(col 22, lines 52-56).

Gadh does not explicitly teach the claimed:

a discontinuity detecting unit detecting an occurrence of discontinuous scenes, which is caused by executing the eye point operation instruction or the object operation instruction;

Conklin teaches the claimed limitations in figure 5, step 504: "Acceptable to Generate

Intermediate Frame(s)?" where intermediate frames are generated when there is

discontinuity.

Gadh does not explicitly teach the claimed:

a complementary instruction generating unit generating an object operation instruction or an eye point operation instruction to generate a scene which complements between the discontinuous scenes, if the occurrence of the discontinuous scenes is detected by said discontinuity detecting unit

Conklin teaches the claimed limitations in figure 5, step 506: "Generate Intermediate

Frame(s)" where the intermediate frames are complements to the discontinuous

scenes.

It would have been obvious to one of ordinary skill in the art at the time of

invention to combine Gadh and Conklin. Conklin teaches one advantage of the

combination by teaching of:

> Another problem associated with existing frame generators is that they
> unintelligently perform frame generation regardless of whether such
> interpolation results in a better quality video presentation ... Thus, since all
> of the vectors do not represent motion, frame generation in these
> instances should not always be employed
> (col 2, lines 29-42).

Gadh would benefit from this improved frame generation technique through better

animation and output performance.

As per claims 4 and 9, Gadh teaches the claimed:

> the three-dimensional model information holds a constraint condition
> between objects which represented by a node in a lower hierarchy of the
> three-dimensional model information is constrained by a node in a higher
> hierarchy;

By teaching of applying constraints to multiple objects in the object hierarchy (see col

23, lines 8-10 and lines 25-29).

Gadh does not explicitly teach the claimed:

> a constraint detecting unit detecting an object operation instruction which
> violates the constraint condition as an error is further comprised, wherein
> an unconstrained object is freely moved as far as it does not interfere with
> another object, and, a constrained object having a predetermined movable
> range is moved within said movable range as far as it does not interfere
> with another object

However, it would have been obvious to one of ordinary skill in the art to assign an error

to an object that violates a constraint while letting unconstrained objects move freely.

Gadh suggests this modification to perform the claimed limitations by teaching of:

> Naturally, a bounding box intersection check **is not always exact** since bounding boxes may intersect where actual element boundaries do not, but it generally has the benefit of being "conservative" insofar as it will report false intersections more often than **false non-intersections**.
> (col 24, lines 55-60)

where a false non-intersection would result in an error. One advantage to such a modification is that the user will clearly know when a violation of a constraint has occurred.

As per claims 5 and 10, Gadh teaches the claimed:

> an editing rule storing unit storing editing rules for editing the object operation instructions sequence when an object operation instruction is inserted/deleted/moved in/from/within the operation instruction sequence, when an animation is edited;

by teaching of "Another role of D is to store the design rules/constraints specified by the designer while creating the design for which the rules apply" (col 23, lines 3-5, also see col 20, lines 13-17 which teaches of shape modification).

Gadh teaches the claimed:

> an operation instruction editing unit referencing the editing rules, and preventing/avoiding an operation if the operation for inserting/deleting/moving an object operation instruction which violates the editing rules in/from/within the operation instruction sequence is performed

By teaching of:

> Another implicit **constraint**, non-obstruction of predefined negative elements, is illustrated in FIG. 13, **where the designer is not allowed to move** rib r.sub.5 to obstruct hole (negative element) h.sub.4
> (col 20, lines 34-36).

As per claims 11 and 12, Gadh teaches the claimed:

> an object operating unit operates an object in a virtual space upon receipt
> of an input of an object operation instruction from a user,

in col 18, lines 14-15.

Gadh teaches the claimed limitations of:

> the interference detecting unit checks the interference between objects
> which accompanies the operation;
>
> when the interference occurs, the interference avoiding unit modifies a
> move direction of an object to a direction where the interference is
> resolved, so that the interference is avoided;

by teaching of:

> **Once an intersection is detected** in VDSF, the designer may choose **to
> allow or disallow the intersection**, and D and S are appropriately
> updated.
>
> (78)   Ideally, such intersections should be **detected in real-time** so that
> graphical computation of the **edited geometry** and **visual feedback** to
> the designer can be (practically) instantaneously provided
> (col 29, lines 5-12).

Gadh teaches the claimed limitations of:

> when an object can be moved without causing interference, the object
> operation instruction is stored in a corresponding instruction sequence
> within the operation instruction storing unit via the instruction sequence
> selecting unit;
>
> the object operating unit performs a constraint deletion operation for an
> object by an operation for removing an object from a tree to which the
> object belongs to, and the object is released from the constraint of a
> parent object

By teaching of:

> Once an intersection is detected in VDSF, the designer may choose **to
> allow or disallow the intersection, and D and S are appropriately
> updated.**
> (col 29, lines 5-7)

where D stores the hierarchy and object tree structure which also stores information about the constraints and objects. Gadh further teaches the claimed limitations by teaching of "Unlike implicit constraints, which are built into the Design Editing Layer, explicit constraints can be redefined by the designer" (including a constraint deletion operation)(col 20, lines 45-47). Further, one of ordinary skill in the art would recognize that the operations performed by Gadh are implemented through instruction sequences.

Gadh does not explicitly teach the claimed:

> when the interference cannot be avoided, the object operation instruction becomes an error;

However, it would have been obvious to one of ordinary skill in the art to assign an error to an object when an intersection cannot be avoided. Gadh suggests this modification to perform the claimed limitations by teaching of intersections that occur when objects are created in a given location and where the user must allow the intersection even if temporarily (col 29, lines 2-7). One advantage to such a modification is that the user will clearly know when a violation of a constraint has occurred.

Response to Arguments

6.   Applicant's arguments with respect to the rejected claims have been considered but are moot in view of the new ground(s) of rejection as necessitated by amendments to the claims.

Conclusion

7.   Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel F. Hajnik whose telephone number is (571) 272-7642. The examiner can normally be reached on Mon-Fri (8:30A-5:00P).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ulka J. Chauhan can be reached on (571) 272-7782. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

5/25/06

DFH

ULKA CHAUHAN
SUPERVISORY PATENT EXAMINER